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ABSTRACT

Personnel at the College of Lake County (CLC) developed a projections model for student enrollment that satisfies the need for information for budget projections and for planning purposes. CLC is a medium-sized suburban community college located north of Chicago. The Enrollment Management Team was asked to create a process to project enrollments for the 3-year planning cycle, fiscal years 1992 through 1994. The process was to provide a rationale for capital requests to the state, to aid in developing schedules and in forecasting the need for staffing, and to project future revenue. The team developed an environmental scanning process to gather data and watch trends. The team chose seats taken and credit hours by discipline as a unit of analysis for projecting enrollments. They then created spreadsheets containing historical midterm enrollment numbers of seats taken and credit hours generated for each discipline and the estimated historical and projected population of the district to which they applied the Microsoft Excel "TREND" function. The results were distributed to associate deans for evaluation and feedback. With finalized projections from the deans the Office of Institutional Research and Planning prepared the final enrollment report. The process took 4 weeks. (JB)

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Enrollment Projections: Combining Statistics and Gut Feelings

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This paper was presented at the Thirty-Third Annual Forum of the Association for Institutional Research held at the Chicago Marriott Downtown, Chicago, Illinois, May 16-19, 1993. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

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Enrollment Projections: Combining Statistics and Gut Feelings

Abstract

Enrollment projections are essential to the planning processes at public community colleges where budgets, in large part, are driven by state allocations based on enrollment and by tuition revenue. Determining the most appropriate method to project enrollments for a particular college can be difficult. This paper describes one community college's development of a projection model that satisfies the need for information for budget projections and for planning purposes. It can be carried out with a small number of institutional research staff but requires a great deal of communication and consensus among several areas of the college.

Enrollment Projections: Combining Statistics and Gut Feelings

Enrollment projections are essential to the planning processes at public community colleges where budgets, in large part, are driven by state allocations based on enrollment and by tuition revenue. Determining the most appropriate method to project enrollments for a particular college can be difficult. Projections by entering cohort, by specific student characteristics (such as gender, race/ethnicity, or age), by previous participation rates, or by academic discipline are among the possibilities. This proposal describes one community college's development of a projection model that satisfies the need for information for budget projections and for planning purposes. It can be carried out with a small number of institutional research staff but requires a great deal of communication and consensus among several areas of the college.

During fiscal year 1991, a planning process was developed involving both the internal and external college community at the College of Lake County, a medium-sized (headcount: approximately 15,600 students) suburban community college located north of Chicago. As the planning process was being designed, the Executive Staff (the President and Vice Presidents) requested that the Enrollment Management Team create a process to project enrollments for the three-year planning cycle, fiscal years 1992 through 1994. Previously, projections of headcount were recommended to the Executive Staff based on the opinions of the Director of Public Relations and the Director of Student Recruitment. No process was in place for using actual enrollment data to calculate future enrollments.

The Enrollment Management Team is headed by the Dean for College Advancement and includes the Directors of Student Recruitment, Institutional Research and Planning, the Data Center, Admission and Records, and Public Relations, and the Associate Deans (responsible for the academic divisions in Educational Affairs). The Team was charged with creating an enrollment projection process that would serve several purposes: to provide rationale for capital requests to the state for expansion of classroom facilities, to aid the Educational Affairs area in

developing schedules and in forecasting the need for staffing, and to project future revenue for budget decisions.

Since fiscal year 1987, the College of Lake County has experienced significant enrollment growth at the rate of approximately four percent annually in F.T.E. The population of the college's service district has also increased, 17 percent from 1980 to 1990. For the past few years, the college has repeatedly requested capital funds from the state of Illinois to build a new multi-use classroom building. To provide additional rationale for these funds, the college needed to develop a method for forecasting future growth. In addition, the Associate Deans required a system to aid them in determining enrollment patterns for scheduling and for requesting additional faculty. Lastly, given that the planning process was closely linked to the budgeting process, the college needed a system to project revenues.

As part of the development of the planning process, an environmental scanning process was created. The findings from the scan meant that, for the first time, college staff had available to them up-to-date information on the demographic, social, and economic trends in the college's district along with data on high school enrollments, graduation rates, and the number of graduates who attended the college fall semester following graduation. Because of the availability of this information, when the development of the enrollment projection process was discussed by the Enrollment Management Team, several methodologies were considered. The team reviewed processes that were in place at other colleges and universities. Consideration was given not only to the methodology used to project enrollments but also to the unit of analysis.

The team considered one method utilizing a straight average to project enrollments by class standing and by semester (Wright, 1990). This technique uses historical enrollment data to predict future enrollments by averaging the annual changes in the past and using the averages to project future enrollments. The unit of analysis is the number of students in each class level; that is, the number of freshmen, sophomores, and so forth. However, this method is not the most appropriate to use when enrollments are increasing. Because it is an average of previous semesters, the technique will consistently underestimate an increasing student enrollment

(Wright, 1990). The method also does not incorporate other significant external factors that may affect enrollment.

Other techniques that the team considered projected enrollments based on student demographic characteristics such as age, gender, or race/ethnicity. One such method is cohort-stripping (Kardonsky and Morishita, 1990), a technique in which a cohort is identified (such as Asian students) which has significantly affected enrollment growth. The cohort students are "stripped" or subtracted from the aggregate enrollment projections based upon their normed participation. The method then projects the cohort's enrollment based upon its unique participation and continuation rates. This method seems to be best suited for colleges where enrollment for an identified cohort is changing at a different rate than that of the rest of the student body. This situation did not apply at the College of Lake County. In fact, reviewing participation rates by student demographic characteristics revealed a great deal of consistency over the previous several years. Participation rates by gender, age, race/ethnicity, and location of the student's home had not changed significantly. Therefore, cohort stripping was rejected as being inappropriate for the college.

Upon further consideration, it was decided that the units of analysis for projecting enrollments should be seats taken and credit hours by discipline. Seats taken and credit hours are the units of analysis for several other College of Lake County reports such as cost/revenue analyses, attrition studies, and year-to-year comparative enrollment reports. It was further determined that the population of the service district needed to be an integral component of the process because typically 94 percent of the students are in-district and because the district population was projected to continue to grow.

Thus, to accomplish all of the objectives of the enrollment projection process, it was decided that the most appropriate method was to develop projections of seats taken and credit hours generated by academic discipline. The projected credit hours would provide information on future revenues in the form of tuition and state appropriations. The projected seats taken

would provide a basis for future scheduling of classes and future needs for additional faculty, space, and facilities.

The method for preparing enrollment projections began in the Office of Institutional Research and Planning with the creation of spreadsheets containing historical midterm enrollment numbers of seats taken and credit hours generated for each discipline and the estimated historical and projected population of the district. Midterm enrollments were used because state appropriations are based on the credit hours generated at midterm. Lake County historical and projected populations were derived from various publications by the Northeastern Illinois Planning Commission. Microsoft Excel was the software used for the enrollment projection process.

Using the estimated yearly district population as the x-values and the historical enrollment numbers for the y-values in the "TREND" function in Excel, a least squares line was created using the following formulas:

$$y = mx + b$$

$$m = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{n(\Sigma x^2) - (\Sigma x)^2}$$

$$b = \frac{(\Sigma y)(\Sigma x^2) - (\Sigma x)(\Sigma xy)}{n(\Sigma x^2) - (\Sigma x)^2}$$

The trend function utilized the linear equation to calculate projected seats taken and credit hours generated by discipline and by semester for the three fiscal years of the planning cycle.

The spreadsheets containing historical enrollments and the predicted values were then distributed to the Associate Deans. Working with their program coordinators and faculty, they evaluated the statistical projections for each discipline in their divisions in light of the situation for that discipline, the findings from the environmental scan, and various enrollment reports. The Associate Deans then adjusted the projections accordingly. For example, although the statistical projections showed growth in Nursing, lack of facilities will prohibit growth in this

discipline for the next several years. Therefore, the statistical projections were adjusted to show no growth. Rationale for adjusting the statistical projections was provided by each Associate Dean when a change was made. Although the Associate Deans had a variety of information on which to draw to adjust the projections, they believed that a part of their decision-making processes in making the changes was based on "gut feelings."

An example of the spreadsheets of enrollment projections for fall semester is presented in Table 1. This spreadsheet was prepared in November, 1990 for the Biology discipline in the Biological and Health Sciences Division. On the left side is the estimated Lake County population, both historical and projected figures. In italics are the projected enrollments for fiscal years 1992 through 1994. Numbers of seats taken and credit hours are given as well as the percent change. As can be seen in Table 1, enrollments in Biology increased rapidly from 1987 through 1990. The initial statistical projections reflected this rapid increase. In this case, the Associate Dean of Biological and Health Sciences, believing that the enrollment would continue rising at its previous rate, did not change the statistical projections. Similar tables were prepared for spring and summer semesters for the three fiscal years.

Table 1

Estimated Historical and Projected Population for Lake County and Historical and Projected Enrollment for the Biology Discipline, 1987 - 1993

Lake County Population		**Fall Enrollment in Biology**			Percentage Change from Previous Year	
Year	Estimated Population	Year	No. of Seats	No. of Hours	Seats	Hours
1987	480,000	1987	730	3,017		
1988	490,000	1988	786	3,239	8%	7%
1989	500,000	1989	866	3,543	10%	9%
1990	510,000	1990	985	4,022	14%	14%
Projected		***Projected***				
1991	*520,000*	1991	*1,053*	*4,285*	*7%*	*7%*
1992	*530,000*	1992	*1,138*	*4,617*	*8%*	*8%*
1993	*540,000*	1993	*1,222*	*4,949*	*7%*	*7%*

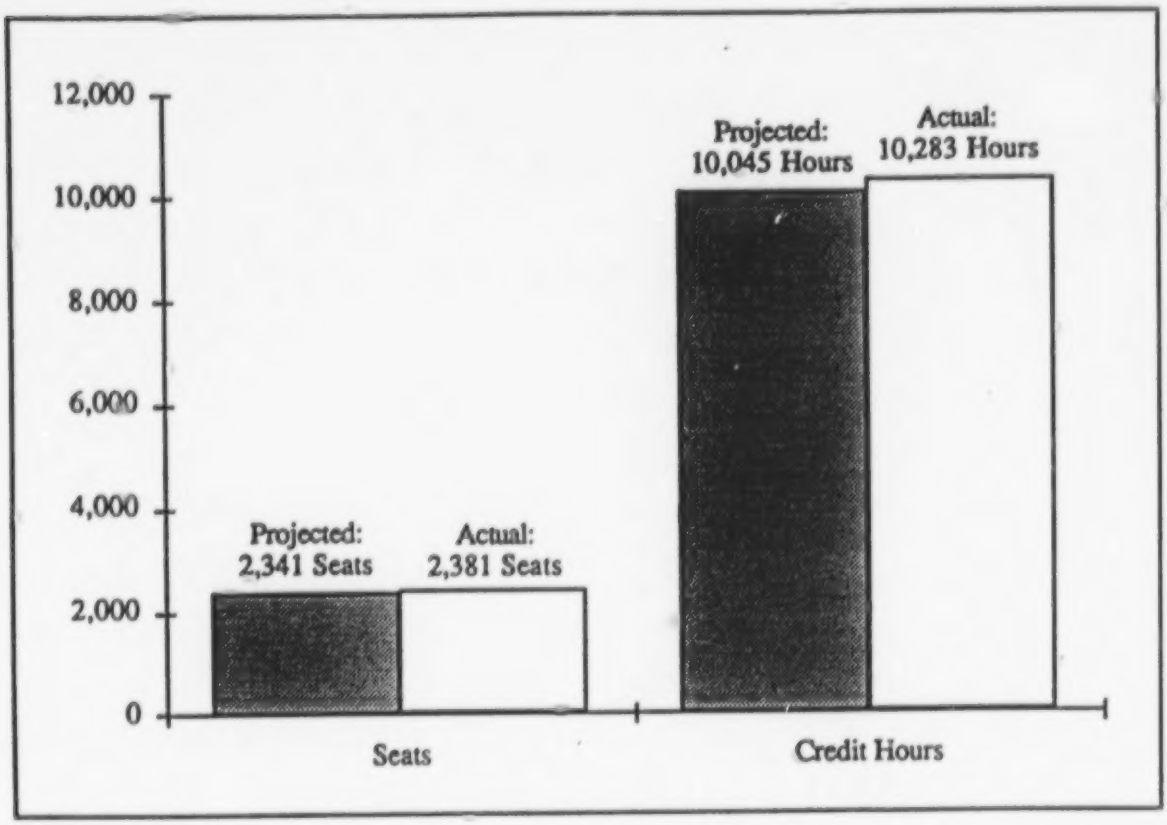
Once the Associate Deans finalized the projections, the Office of Institutional Research and Planning prepared the enrollment projection report. The enrollment projection report included spreadsheets containing the historical and adjusted projected enrollments by discipline, spreadsheets that presented aggregate projections for each semester for each of the seven divisions, and a table that presented aggregate projections of seats taken and credit hours for each semester for all divisions. In addition, the rationale for any changes which the Associate Deans had made to the statistical projections was included. The Enrollment Management Team reviewed the projections and then presented them to the Executive Staff.

Although this appears to be a lengthy process, it took place within a four-week period, beginning in October (after the midterm of the fall semester) and ending in November. The projections had to be in place by the middle of November so that the Executive Staff could use them for formulating the college-wide goals and objectives and for making revenue projections for the three fiscal years of the planning cycle. After changing the spreadsheets to reflect the previous year's actual enrollments, the process is repeated every fall when the Enrollment Management Team recommends projections for the next three fiscal years.

At the end of every semester, the Office of Institutional Research and Planning prepares charts and spreadsheets showing the comparisons by academic division between the projections, both statistical and the Associate Deans' adjustments, and the actual enrollments. These materials are reviewed by the Enrollment Management Team and the Executive Staff. An example of a graph showing the comparison between the actual enrollment and the Associate Dean's projected enrollment is presented for the Biological and Health Sciences Division for fall 1991 (fiscal year 1992) in Figure 1. The Associate Dean's projections fell two percent under the actual enrollments.

Figure 1

A Comparison of Projected and Actual Enrollments for the Biological and Health Sciences Division for Fall Semester 1991



The college staff involved with the enrollment projection process believes it is working and achieving the purposes for which it was established. Previously, the process was as important as the resulting products. More attention was paid to developing an understandable, participatory, and credible process than was paid to the results of the projections. However, now that the process is well established, the Executive Staff focuses on the accuracy of the projections rather than the process. The Associate Deans as well as the entire Enrollment Management Team are held accountable for their predictions.

The benefits of the process are many. They include closer communication between the Office of Institutional Research and Planning and Educational Affairs. This has resulted in better use of the products and services of the Institutional Research and Planning Office by Educational Affairs. In addition, the process causes the Associate Deans to think about the future of the disciplines for which they are responsible in terms of staffing, program review, course delivery, and space needs. The process also facilitates better communication among the academic areas, Student Recruitment, and Public Relations. With the examination of historical and projected enrollments, disciplines that may be in decline in terms of enrollment are more easily identified. With better detection and communication, recruitment and marketing activities can be designed to build enrollments.

In sum, the enrollment projection process has become an integral component of planning and budgeting at the college. It provides essential information in determining the strategic direction of the college as the institution plans for the future.

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